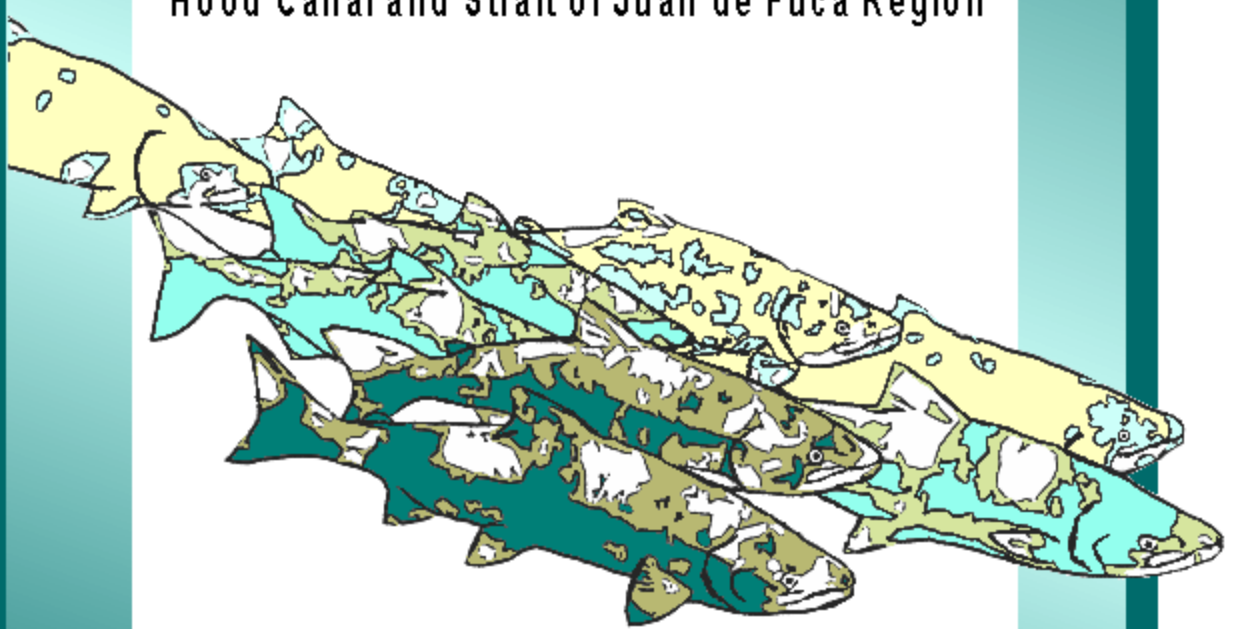
Summer Chum Salmon Conservation Initiative

An Implementation Plan
to Recover Summer Chum Salmon in the
Hood Canal and Strait of Juan de Fuca Region



Washington Department of Fish and Wildlife
Point No Point Treaty Tribes

April 2000

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Jim Ames
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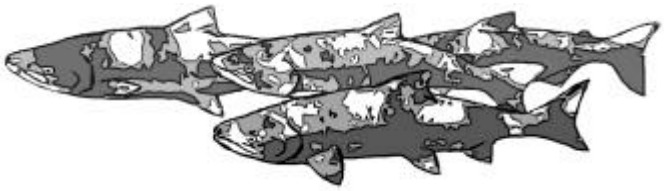
Editors



Washington Department of Fish and Wildlife
Point-No-Point Treaty Tribes

April 2000

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This summer chum salmon conservation initiative is the result of the collective efforts of a team of fisheries biologists representing tribal organizations, and state and federal agencies. The following individuals were instrumental in developing the technical analyses and written material that make up this recovery plan.

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Contents

Summer Chum Salmon Conservation Initiative
An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region

Foreword 1
- Introduction 1
- Goal of the Initiative 2
- Relevant Standing Orders and Agreements 3
- Ongoing Activities, Initiatives, and Processes 3
  - 1992 - Wild Stock Restoration Initiative (WSRI) 3
  - 1992 - Artificial Production 4
  - 1992 - Harvest Management 5
  - 1993 - Wild Salmonid Policy (WSP) 5
  - 1994 - Endangered Species Act (ESA) 6
  - 1994 - Hood Canal Coordinating Council (HCCC) 6
  - 1997 - Governor's Salmon Recovery Office (SRO) 6
  - 1997 - Conservation Commission 7
  - 1997 - Salmon Recovery Lead Entities 7
  - 1999 - Salmon Recovery Funding Board 7
  - 2000 - Forest and Fish Report 7
- Plan Development and Organization 7
  - Plan Development 8
  - Plan Organization 8
- Future Actions 9

Part One Life History and Stock Assessment 11
- 1.1 Introduction 11
- 1.2 Background 11
- 1.3 Summer Chum Salmon Life History 12
  - 1.3.1 Description and Distribution 12
    - 1.3.1.1 Description 12
    - 1.3.1.2 Distribution 13
  - 1.3.2 Life History Strategy 13
  - 1.3.3 Freshwater Juvenile Life History 14
    - 1.3.3.1 Incubation 14
    - 1.3.3.2 Emergence and Downstream Migration 14
  - 1.3.4 Estuarine and Marine Life History 15
    - 1.3.4.1 Estuarine Behavior 15
    - 1.3.4.2 Food 15
    - 1.3.4.3 Juvenile Seaward Migration 16
    - 1.3.4.4 Ocean Migration 16
    - 1.3.4.5 Adult Nearshore Migration 17

1.3.5 Adult Freshwater Migration and Spawning 17
1.3.5.1 River Entry 17
1.3.5.2 Spawning 17
1.4 Summer Chum Salmon Data 18
1.4.1 Introduction 18
1.4.2 Escapement Data 18
1.4.2.1 Historical Estimates 18
1.4.2.2 Current Estimates 19
1.4.2.3 Escapement Timing 21
1.4.3 Harvest Data 22
1.4.4 Run Size 23
1.4.4.1 Run Re-construction 23
1.4.4.2 New Summer Chum Run Re-construction 24
1.4.5 Age Data 25
1.4.6 Use of Stock Assessment Data 26
1.4.6.1 Escapement and Runsize 26
1.4.6.2 Age Data and Productivity Estimates 26
1.4.6.3 Population Structure and Genetics 27
1.5 Period of Decline 27
1.5.1 Introduction 27
1.5.2 Hood Canal 27
1.5.3 Strait of Juan de Fuca 28
1.6 Recent Abundance Trends 29
1.7 Stock Evaluations 31
1.7.1 Introduction 31
1.7.2 Stock Definition and Status (SASSI) 32
1.7.2.1 Existing Stocks 33
1.7.2.2 Recently Extinct Stocks 39
1.7.2.3 Possible Additional Historic Distributions 42
1.7.3 Annual Abundance Evaluation 43
1.7.3.1 Management Units 43
1.7.3.2 Status of the Mainstem Hood Canal Management Unit 44
1.7.4 Stock Extinction Risk 45
1.7.4.1 Introduction 45
1.7.4.2 Assessing Risk 47

Part Two Region-wide Factors For Decline 53
2.1 Introduction 53
2.2 Negative Impacts On Abundance 54
2.2.1 Introduction 54
2.2.2 Climate 54
2.2.2.1 Ocean Effects (ENSO and PDO) 55
2.2.2.2 Estuarine Effects 56
2.2.2.3 Freshwater Effects 56
2.2.2.4 Conclusions 61

2.2.3 Ecological Interactions 65
2.2.3.1 Wild Fall Chum Salmon 67
2.2.3.2 Hatchery Fall Chum 69
2.2.3.3 Other Salmonids 74
2.2.3.4 Marine Fish 79
2.2.3.5 Birds 80
2.2.3.6 Marine Mammals 81
2.2.3.7 Conclusions 83
2.2.4 Habitat 84
2.2.4.1 General Summer Chum Habitat Overview 84
2.2.4.2 Historical Habitat Impacts On Summer Chum Salmon 87
2.2.4.3 Conclusions 91
2.2.5 Harvest 91
2.2.5.1 Pre-terminal Harvest 92
2.2.5.2 Terminal and Extreme Terminal Harvest 94
2.2.5.3 Conclusions 96
2.3 Rating of Factors For Decline 96
2.3.1 Introduction 96
2.3.2 Ratings 97
2.3.3 Climate 97
2.3.4 Ecological Interactions 98
2.3.5 Habitat 99
2.3.6 Harvest 99
2.3.7 Cumulative Impacts 99
2.3.7.1 Hood Canal 100
2.3.7.2 Strait of Juan de Fuca 100
2.4 Factors Affecting Recovery 101

Part Three Evaluation and Mitigation of Factors for Decline 103
3.1 Introduction 103
3.2 Artificial Production 105
3.2.1 Introduction 105
3.2.1.1 Rationale 105
3.2.1.2 Intent 105
3.2.1.3 Anticipated Benefits of Supplementation Approach 106
3.2.1.4 Potential Hazards and Limitations 107
3.2.1.5 Overview of Contents 107
3.2.2 Supplementation/Reintroduction Approach 108
3.2.2.1 When to Supplement and When to Reintroduce 108
3.2.2.2 When to Modify or Stop a Supplementation or Reintroduction Program 113
3.2.2.3 How to Supplement - *General Guiding Principles* 116
3.2.2.4 Monitoring and Evaluation 126
3.2.2.5 Additional Research Needs 131
3.2.3 Project Selection and Implementation 132

3.2.3.1 Introduction 132
3.2.3.2 Existing Supplementation and Reintroduction Activities 132
3.2.3.3 Proposed Supplementation/Reintroduction 133
3.2.3.4 Implementation Plans 161
3.2.3.5 Specific Criteria Guiding Supplementation Program Operations 170
3.2.4 Funding Priorities 171
3.2.4.1 Criteria 171
3.2.4.2 Supplementation Plan Priorities 171
3.3 Ecological Interactions 173
3.3.1 Impacts of Supplemented Summer Chum 173
3.3.1.1 Predation 173
3.3.1.2 Competition 174
3.3.1.3 Disease Transmission 174
3.3.2 Impacts of Other Species on Summer Chum Salmon 175
3.3.2.1 Hatchery Salmonids 175
3.3.2.2 Marine Mammals 231
3.4 Habitat 233
3.4.1 Introduction 233
3.4.2 Background and Ecological Context 234
3.4.2.1 Freshwater Environment 235
3.4.2.2 Subestuarine Environment 237
3.4.2.3 Estuarine Landscape 239
3.4.3 Limiting Factor Analysis: Methodology and Results 240
3.4.3.1 Methodology 240
3.4.3.2 Results of Limiting Factor Analysis 245
3.4.4 Protection/Restoration Strategy 251
3.4.4.1 Protection/Restoration Strategy Overview 251
3.4.4.2 Tool Kit of Protection/Restoration Strategies by Habitat Parameter 253
3.4.4.3 Evaluation Criteria for Proposed Restoration Projects 266
3.4.5 Strategy for Monitoring Population and Habitat Recovery 267
3.4.6 Implementation of Habitat Elements of Summer Chum Recovery Plan . 271
3.5 Harvest Management 277
3.5.1 Introduction 277
3.5.2 Description of Management Units, Stocks, and Their Status 278
3.5.2.1 Management Unit: Sequim Bay 282
3.5.2.2 Management Unit: Discovery Bay 282
3.5.2.3 Management Unit: Hood Canal Mainstem 283
3.5.2.4 Management Unit: Quilcene/Dabob Bays 284
3.5.2.5 Management Unit: Southeast Hood Canal 285
3.5.3 Description of Fisheries 286
3.5.3.1 Canadian Fisheries 290
3.5.3.2 Washington Pre-terminal Area Fisheries 292
3.5.3.3 Washington Terminal Area Fisheries 297

3.5.3.4 Washington Extreme Terminal Area Fisheries 298
3.5.4 Relationship of Harvest to Other Factors for Decline 300
3.5.4.1 Climate 300
3.5.4.2 Ecological Interactions 301
3.5.4.3 Habitat Degradation 301
3.5.5 Stock Assessment Information and Limitations 302
3.5.5.1 Abundance 302
3.5.5.2 Productivity 302
3.5.5.3 Population Structure 303
3.5.6 Harvest Management Strategies 303
3.5.6.1 Base Conservation Regime 304
3.5.6.2 Harvest Regime Modification 315
3.5.6.3 Fishery Performance Standards 316
3.5.7 Implementation 316
3.5.7.1 Annual Plan Implementation 317
3.5.8 Expected Regime Effects on Recovery 318
3.5.9 Compliance and Enforcement 320
3.5.10 Harvest Management Monitoring and Assessment 321
3.5.11 Adaptive Management 324
3.5.12 Stock Assessment Information Needs 325
3.6 Program Integration and Adaptive Management 329
3.6.1 Critical Thresholds and Response 330
3.6.2 Annual Plan Report 331
3.6.3 Five Year Plan Review 331
3.6.4 Performance Standards 333
3.6.4.1 Abundance 333
3.6.4.2 Productivity 334
3.6.4.3 Escapement 334
3.6.4.4 Management Actions 334

Part Four Summary of Plan Elements 337
4.1 Introduction 337
4.2 Summary of Plan Objectives, Strategies, and Actions 337
4.2.1 Artificial Production 338
4.2.2 Ecological Interactions 342
4.2.3 Harvest Management 344
4.2.4 Habitat 347
4.2.5 Monitoring and Evaluation 366
4.2.6 Program Integration and Adaptive Management 372
4.3 Accomplishing Goals of Recovery Plan and Meeting ESA Objectives 374
4.3.1 Achieving the Recovery Plan Goal 374
4.3.1.1 Artificial Production 374
4.3.1.2 Ecological Interactions 375
4.3.1.3 Habitat 375
4.3.1.4 Harvest Management 376

4.3.1.5 Cumulative Effects of Recovery Actions 376
4.3.2 Meeting ESA Objectives 376
4.3.2.1 NMFS - Critical and Desirable Elements 377
4.3.2.2 NMFS Elements and the Summer Chum Plan 377
4.4 Population-based Recovery Goals 380
4.5 Plan Implementation 381
4.6 Plan Supplements 382

References 385

Glossary 407

Part One - Appendix A1.1
Appendix Figures A1.3
Appendix Tables A1.7
Appendix Reports
1.1 - Methodology for Summer Chum Salmon Escapement Estimation A1.11
1.2 - Methodology for Estimation of Summer Chum Salmon Escapement and Freshwater Entry Timing A1.17
1.3 - Methodology for Summer Chum Salmon Run Re-construction A1.25
1.4 - Summary of SASSI Definitions and Criteria A1.55
1.5 - Derivation of Critical Abundance Thresholds for Management Units and Escapement Distribution and Minimum Escapements Flags for Stocks A1.67

Part Two - Appendix A2.1
Appendix Figures A2.3
Appendix Tables A2.13

Part Three - Appendix A3.1
Appendix Reports
3.1 - Specific Criteria Guiding Supplementation and Reintroduction Program Operations A3.3
3.2 - Existing Summer Chum Supplementation and Reintroduction Projects A3.15
3.3 - Genetic Hazards Discussion A3.27
3.4 - Worksheets for Assessment of Supplementation Hazards A3.45

3.5 - Estuarine Landscape Impacts on Hood Canal and the Strait of Juan de Fuca Summer Chum Salmon and Recommended Actions A3.111
3.6 - Summer Chum Watershed Narratives A3.133
3.7 - Riparian Assessment Methodology and Summary of Results A3.233
3.8 - Freshwater Habitat Data Summary and Analysis Criteria A3.239
3.9 - General Fishing Patterns and Regulatory Summary by Year, Fishery, and Fleet A3.243

Executive Summary
Summer Chum Salmon Conservation Initiative
An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region

Foreword

Background and Goal

Hood Canal and Strait of Juan de Fuca summer chum experienced a severe drop in abundance in the 1980s, and returns decreased to all time lows in 1989 and 1990 with less than a thousand spawners each year. In response to this alarming decline, the state and tribal co-managers began to implement harvest management actions in 1992 to afford greater protection to summer chum in terminal area fisheries and, together with the U.S. Fish and Wildlife Service (USFWS) and citizen groups, initiated three summer chum hatchery supplementation programs. Those actions were expanded in subsequent years and led to the development of the Summer Chum Salmon Conservation Initiative - An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region.

Hood Canal and Strait of Juan de Fuca Salmon Co-managers

The Point-No-Point Treaty Tribes including: the Skokomish Tribe, the Port Gamble S'Klallam Tribe, The Jamestown S'Klallam Tribe, and the Lower Elwha Klallam Tribe; and the Washington State

In March of 1999, the National Marine Fisheries Service (NMFS) determined that the summer chum originating from Hood Canal and the Strait of Juan de Fuca represented an Evolutionarily Significant Unit (ESU), and formally listed these fish under the Endangered Species Act (ESA) as a threatened species.

The Summer Chum Salmon Conservation Initiative Goal is:

To protect, restore and enhance the productivity, production and diversity of Hood Canal summer chum salmon and their ecosystems to provide surplus production sufficient to allow future directed and incidental harvests of summer chum salmon.

Plan Development

The conservation initiative (or plan) has been developed and agreed upon by the Washington Department of Fish and Wildlife (WDFW) and the Point No Point Treaty (PNPT) Tribes under their authority to co-manage salmon pursuant to the rules and orders of U.S. v. Washington. The plan is consistent with and fulfills the intent of section 13 of the Puget Sound Salmon Management Plan, which calls for the development of comprehensive regional resource management plans for Puget Sound stocks of salmon. In addition, the goal, direction, and provisions of the summer chum recovery initiative are consistent with the guidance within the WDFW Wild Salmonid Policy. The USFWS and NMFS have also participated in the development of the plan at the request of the WDFW and the PNPT Tribes.

Plan Organization

Organization of the conservation initiative is in five major parts: the Foreword, which sets the stage; Part One - Life History and Stock Assessment, which describes summer chum life history, discusses the available data, and provides stock evaluation tools; Part Two - Region-wide Factors for Decline, which contains a region-wide analysis and summary of those factors believed responsible for the recent decline of summer chum; Part Three - Evaluation and Mitigation of Factors for Decline, which provides more detailed, location-specific analysis of factors affecting summer chum and presents strategies for their protection and recovery; and Part Four - Summary of Plan Elements, which contains a summary description of the management components, and also describes specific actions, evaluation and monitoring, roles of the participating parties, and time frames.

Future Actions

It is the intent of WDFW and the PNPT Tribes to implement the initiative as a comprehensive regional management plan, as provided for in the Puget Sound Salmon Management Plan. The implementation of the elements of the plan, that are specifically within the jurisdiction of the state and tribal co-managers, would then be under a Federal court order. This will provide certainty that the sections of the plan dealing with the elements of artificial production, ecological interactions, and harvest management will be carried out consistent with the plan. To facilitate an adaptive management approach, annual reports and five year plan reviews will be conducted to measure overall progress toward recovery and to evaluate and/or revise the strategies and actions provided in the plan.

The habitat element assesses habitat factors for decline and recommends strategies and actions to sustain and rebuild summer chum salmon in this region. The authorities to implement these measures, however, are dispersed through a variety of federal, state and local jurisdictions. The parties to the plan will continue to work with the appropriate jurisdictions to develop the implementation plans and actions for habitat protection and restoration. Habitat implementation plans and actions developed by a variety of agencies and processes are expected to be consistent and integral to the plan and are vital to its success. Furthermore, the plan provides critical guidance to the lead entities and the Salmon Recovery Funding Board, helping to ensure that funded recovery projects in Hood Canal and the eastern Strait of Juan de Fuca will have a high likelihood of supporting summer chum recovery.

Part One
Life History and Stock Assessment

Summer Chum Salmon Life History

Summer chum salmon are the earliest returning chum salmon stocks in the Hood Canal and Strait of Juan de Fuca (HC-SJF) region. These stocks have been shown to be genetically distinct from fall and winter timed chum salmon. A total of 11 streams in Hood Canal have been identified as recently having indigenous summer chum populations: Big Quilcene River, Little Quilcene River, Dosewallips River, Duckabush River, Hamma Hamma River, Lilliwaup River, Union River, Tahuya River, Dewatto River, Anderson Creek, and Big Beef Creek. Summer chum are occasionally observed in other Hood Canal drainages, including the Skokomish River which once supported a large summer chum population. Summer chum salmon populations in the eastern Strait of Juan de Fuca occur in Snow and Salmon creeks in Discovery Bay, in Jimmycomelately Creek in Sequim Bay, and have been reported in Chimacum Creek. Recent stock assessment data indicate that summer chum also return to the Dungeness River, but the magnitude of returns is unknown.

Summer chum spawning occurs from late August through late October, generally within the lowest one to two miles of the streams. Depending upon temperature regimes in spawning streams, eggs and alevins develop in the redds for approximately 18-20 weeks before emerging as fry between February and the last week of May. Summer chum fry emerge from the stream gravels and immediately commence migration downstream to estuarine areas, with total brood year migration from freshwater ending within roughly 30 days for smaller streams and rivers.

In Puget Sound, chum fry have been observed through annual estuarine area fry surveys to reside for their first few weeks in the top 2-3 centimeters of surface waters and extremely close to the shoreline. Chum fry maintain a nearshore distribution until they reach a size of about 45-50 mm, at which time they move to deeper off-shore areas. Upon reaching threshold size in the estuary summer chum are thought to immediately commence migration seaward.

After two to four years of rearing in the northeast Pacific Ocean, maturing Puget Sound-origin chum salmon follow a southerly migration path parallel to the coastlines of southeast Alaska and British Columbia. Summer chum mature primarily at 3 and 4 years of age with low numbers returning at age 5. They enter the Strait of Juan de Fuca from the first week of July through September and the Hood Canal terminal marine area from early August through the end of September. Summer chum adults may mill in front of their stream of origin for up to ten to twelve days before entering freshwater to spawn.

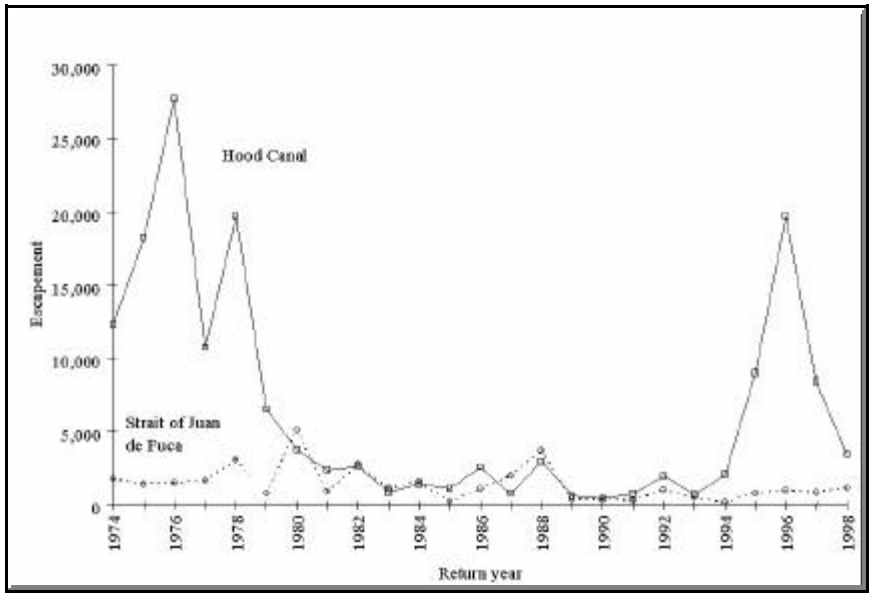
Use of Stock Assessment Data

The quality and quantity of the available stock assessment data for summer chum salmon varies for individual parameters. New data will be incorporated into the recovery plan as it becomes available. The following are summaries of the utility of the various types of summer chum stock assessment data.

Escapement and Runsize - Both escapement and runsize (run re-construction) databases have been reviewed and substantially improved to provide the best available information for use in recovery planning. The summer chum salmon recovery plan focuses on escapement and runsize information for the 1974 through 1998 return years.

Age Data and Productivity Estimates - Because of the multi-brood life history pattern, resulting in returns of 3 to 5 year old summer chum salmon each year, any direct measures of their productivity necessarily depends on the availability of reliable age data. The age data that have been previously collected are not of sufficient quality to meet this need. A point that must be emphasized is that because of the lack of useable age data, no estimates of summer chum productivity (brood return or survival rates) are used in the recovery plan. The collection of appropriate age data for deriving survival rates is a high priority and is imperative to measure progress toward recovery.

Period of Decline - The summer chum salmon populations of Hood Canal and Strait of Juan de Fuca streams are affected by different environmental and harvest impacts, and display varying survival patterns and stock status trends. The summer chum stocks from both regions have dropped in abundance, but at different times and with different trends of abundance. While the rate and pattern of decline varies by individual population, all Hood Canal summer chum populations (except Union River) experienced a decline after 1978, and Strait of Juan de Fuca populations dropped in abundance ten years later (see, for example, figure above). Some improvements in total run size and escapements for these summer chum stocks have been noted in recent years, however, the time frame is short, and some individual populations are still experiencing very small escapements.



Hood Canal and Strait of Juan de Fuca summer chum spawning escapements, 1974-98.

Stock Evaluations

The evaluation tools that will be used to identify summer chum stocks performing poorly and to measure the success of recovery measures are a major component of the recovery plan. Three independent assessment methods are presented below, each serving a separate purpose.

Stock Definition and Status (SASSI) - The first stock evaluation approach reviews and updates the summer chum stock definitions and status ratings using the SASSI criteria for identifying stocks based on their degree of reproductive isolation, and rating the status of stocks into the general categories of healthy, depressed, critical, extinct, and unknown. For the recovery plan, the most recent information on historical and current summer chum salmon distribution and on the genetic profiles of the populations has been reviewed. This analysis has produced an updated list of 16 summer chum stocks, which form the basic population units used throughout the recovery plan. Status ratings for each stock are also presented, primarily for use in various other processes and evaluations that are based on the SASSI approach. The recovery plan does not directly use these SASSI status ratings, but instead relies on the more detailed status evaluations below; which specifically focus on annual escapement numbers and extinction risk for summer chum salmon.

Known, recently extinct stocks have also been included where there is strong evidence to show that a stock formerly existed but is now extirpated from its former stream. Of the 16 stocks identified (see table below), seven are recent extinctions. The determination that these are distinct stocks is based solely on past distribution and presumed past reproductive isolation.

Summary of Hood Canal and the Strait of Juan de Fuca native summer chum salmon stocks, including existing and recently extinct stocks and stock origin.

Stock	Status	Stock	Status
Union	Healthy	Dungeness	Unknown
Hamma Hamma	Depressed	Big Beef	Extinct
Duckabush	Depressed	Anderson	Extinct
Dosewallips	Depressed	Dewatto	Extinct
Big/Little Quilcene	Depressed	Tahuya	Extinct
Snow/Salmon	Critical	Skokomish	Extinct
Lilliwaup	Critical	Finch	Extinct
Jimmycomelately	Critical	Chimacum	Extinct

It is likely that summer chum were historically distributed among additional streams within the region. For several streams, relatively recent evidence indicates that summer chum were historically present. However, this evidence is fragmentary and judged insufficient to identify stocks. A distinction is made here between stock and historic distribution, where a stock is defined under SASSI as being (or formerly has been) self-sustaining and reproductively isolated from other stocks based on available evidence. The assessment of the historic use of these streams by summer chum salmon could change as more information becomes available.

Annual Abundance Evaluation - The second evaluation approach compares spawner escapements and runsizes to stock-specific critical abundance thresholds (see table below). This annual process reviews escapements, and identifies (flags) any stock that falls below its threshold. At the end of each season, all

flagged stocks will undergo an in-depth review of stock performance, and possible causes of the low escapement or runsize will be identified. If necessary, remedial measures will be incorporated into recovery activities the following year.

Critical Thresholds for Hood Canal and Strait of Juan de Fuca Management Units.

Management Units	Contributing Stocks	Critical Escapement Thresholds	Critical Runsize Thresholds
Sequim Bay	Jimmycomelately	200	220
Discovery Bay	Snow/Salmon	850	930
Mainstem Hood Canal (Hood Canal Bridge to Ayres Point)	Lilliwaup Hamma Hamma Duckabush Dosewallips Total	2,660	3,980
Quilcene/Dabob Bays	Big/Little Quilcene	1,110	1,260
SE Hood Canal	Union	300	340
Total		**4,750**	**5,400**

Stock Extinction Risk - The third procedure is used to estimate extinction risk based on the numbers of effective spawners representing each summer chum stock. This evaluation assesses extinction risk using an approach described in the paper Prioritizing Pacific Salmon Stocks for Conservation, by Allendorf et al. (1997). The approach focuses on the minimum numbers of spawners required to have a viable population, and estimates the risk of extinction for populations below the viability threshold. This assessment identifies two stocks that are currently rated as having a high risk of extinction; Lilliwaup and Jimmycomelately. A moderate risk of extinction rating is assigned to the Hamma Hamma and Union stocks, and Dungeness is rated of special concern because of the lack of stock assessment information. The remaining summer chum stocks currently have a low risk of extinction.

Part Two
Region-wide Factors For Decline

Like all Pacific salmon, summer chum salmon are influenced by a variety of factors, with both positive and negative consequences for their overall survival. Part Two examines ***region-wide*** factors affecting production, both natural and human caused, to identify those that have been observed to change in concert with the recent summer chum salmon decline.

Those factors implicated in the recent abrupt decline of summer chum salmon do not necessarily include those effects that over time, gradually and cumulatively have impacted salmon survivals. For example, many negative anthropogenic habitat-related impacts affecting salmon populations have occurred prior to the period of recent decline addressed here. Additionally, nearly two decades have passed since the beginning of the recent decline of summer chum, and a broader range of negative conditions now exist. All known negative factors must be addressed to effect the recovery, stability, and sustainability of Hood Canal and the Strait of Juan de Fuca summer chum salmon stocks.

Negative Impacts On Abundance

Those factors that can influence summer chum salmon abundance have been examined in an attempt to identify specific sources of mortality that have contributed to the declines of Hood Canal and the Strait of Juan de Fuca summer chum salmon. Potential factors affecting production have been examined individually in the following four categories: 1) climate, 2) ecological interactions, 3) habitat, and 4) harvest.

Among the factors for decline, only the effects of harvest can be readily quantified. Because of this, the ranking of the various factors for decline is necessarily a subjective process. The following four categories are used to rate the various factors for decline: 1) major impact, 2) moderate impact, 3) low or not likely impact, or 4) undetermined impact. The ratings of factors for decline are presented in the table below. Three primary factors have combined to cause the decline of summer chum salmon in both Hood Canal and Strait of Juan de Fuca streams; habitat loss, fishery exploitation, and climate related changes in stream flow patterns.

Ratings of region-wide factors for decline of summer chum salmon in Hood Canal and Strait of Juan de Fuca streams.

Impact ratings: UUU Major UU Moderate U Low or not likely ? Undetermined

Factor	Hood Canal	Strait of Juan de Fuca
Climate		
Ocean conditions	?	?
Estuarine conditions	?	?
Freshwater conditions	**UU**	**UUU**
Ecological Interactions		
Wild fall chum	**U**	**U**
Hatchery fall chum	**U**?	**U**
Other salmonids (including hatchery)	**UU**	**U**
Marine fish	**U**	**U**
Birds	**U**	**U**
Marine mammals	**U**	**U**
Habitat		
Cumulative impacts	**UUU**	**UUU**
Harvest		
Canadian pre-terminal catch	**U**	**UU**
U.S. pre-terminal catch	**U**	**U**
Terminal catch	**UUU**	**U**

Factors Affecting Recovery

The general assessment of factors for decline of summer chum salmon has focused specifically on changes in fish production and potential survival factors that occurred twenty years ago in Hood Canal and ten years ago in the Strait of Juan de Fuca. Because of the time that has passed since the declines in the two regions, recovery may not involve just the factors that contributed to the decline. Some of the factors discussed above may not have had major, or even moderate impacts on the declines of summer chum salmon, but now may be factors that will slow recovery. Two examples of these impediments to recovery are the

recent increase of the harbor seal population (potential summer chum predators) and recent climate changes causing unfavorable spawning and incubation stream flows.

There have also been a number of factors that are positive for summer chum salmon recovery. One is the successful reduction of Hood Canal terminal area exploitation rates. The average terminal area incidental harvest has been just over 1% during the 1993-1997 seasons. Successful supplementation projects on two stocks are increasing the numbers of returning summer chum adults to two streams (Quilcene River and Salmon Creek). There have also been meaningful changes in the management and culture of hatchery salmonids in the region, designed to reduce negative interactions with summer chum juveniles. The combined effects of these changes in summer chum salmon management have contributed to the increased escapements in recent years. However, additional measures, particularly with respect to habitat protection and restoration, are required for successful recovery of summer chum.

Part Three
Evaluation and Mitigation of Factors for Decline

Part Three of the plan evaluates factors for decline for summer chum salmon at the watershed and management unit levels, and provides specific strategies for recovery. It is arranged in five sections; Artificial Production, Ecological Interactions, Habitat, Harvest Management, and Program Integration and Adaptive Management. Each of these sections provides specific recommendations for actions to aid the recovery of summer chum stocks.

Artificial Production

Goals and Objectives - The following statement presents the goals for artificial production, which are directed at ***only*** those existing populations identified as ***at risk of extinction*** in the plan, and also are directed at ***selected***, extirpated populations within the region.

> ***"Restore naturally-producing, self-sustaining populations to their historic localities and levels of production, and minimize the risk of further declines, while conserving the genetic and ecological characteristics of the supplemented and reintroduced populations, and avoiding genetic and ecological impacts to other populations."***

The co-manager's objectives in developing supplementation and reintroduction projects are: 1) to rebuild summer chum populations at risk of extinction, 2) to restore summer chum to streams where a viable spawning population no longer exists, 3) to maintain or increase summer chum populations of selected streams to a level that will allow their use as broodstock donors for streams where the summer chum population has been lost, and 4) to avoid and reduce the risk of deleterious genetic and ecological effects.

Benefits and Risks - Implied within the list of objectives is the intent to consider potential benefits and risks associated with artificial production. Potential benefits to natural populations include: 1) reduction of short-term extinction risk, 2) preservation of populations while factors for decline are being addressed, 3)

speeding recovery, 4) establishing a reserve population for use if the natural population suffers a catastrophic loss, 5) re-seeding vacant habitats capable of supporting salmon, and 6) providing scientific information regarding the use of supplementation in conserving natural populations. Potential hazards known to be associated with artificial production include: 1) partial or total hatchery failure resulting in a loss of summer chum that had been placed in the hatchery, 2) ecological effects on natural populations from predation, competition or disease transfer, 3) loss of genetic variability between or within natural populations, 4) effects from selection or reducing the population size of donor stocks, and 5) effects on other salmonid populations and species.

Operational Criteria and Adaptive Management - Operational criteria are described that provide guidelines on how to supplement and reintroduce summer chum while minimizing risk. Specific project operational recommendations are made regarding how broodstocking, incubation, rearing, and release or planting of summer chum should occur. Adaptive management guidelines are also provided that describe when to modify a project.

Monitoring and Evaluation - Monitoring and evaluating the effects of supplementation and reintroduction on the natural summer chum populations, and monitoring the performance of the programs in effecting the recovery of summer chum, are essential to the successful use of artificial production. The basic approach to monitoring and evaluation will be to collect information that will help determine: 1) the degree of success of each project, 2) if a project is unsuccessful, why it failed, 3) what measures can be implemented to adjust a program that is not meeting objectives set forth for the project, and 4) when to stop a supplementation project. Descriptions are provided of the specific elements of monitoring and evaluation actions consistent with this approach.

Project Selection - To better accommodate realization of potential benefits and to avoid potential hazards, a selection process has been applied to the existing and recently extinct stocks (identified in Part One) to identify candidates for supplementation and reintroduction. Stocks with existing supplementation and reintroduction projects are included in this selection process to show how they would fare in comparison to the other streams.

The first part of the selection process is a general assessment that considers the need, urgency, and practicality of supplementation/reintroduction for each stock. The second part of the selection process subjects each candidate stock to an assessment focusing on potential risks from hatchery failure, ecological hazards, and genetic hazards. The results of the selection process are discussed and recommendations are provided on whether or not to proceed with a supplementation or reintroduction project (see following table).

Recommended summer chum salmon supplementation and reintroduction projects.		
Existing Projects	*Recommended to Continue*	
	Supplementation	Big Quilcene, Lilliwaup, Salmon
	Reintroduction	Big Beef, Chimacum
	Recommended with Qualification	
	Supplementation	Hamma Hamma (requires effective broodstocking)
New Projects	Supplementation	Jimmycomelately
	Reintroduction	None
Potential Future Projects	Supplementation	Union (for developing as donor stock)
	Reintroduction	Tahuya, Dewatto
Projects Not Recommended at This Time	Supplementation	Dungeness, Dosewallips, Duckabush
	Reintroduction	Skokomish, Anderson, Finch

Funding Priorities and Descriptions of Existing Projects - Priorities for funding recommended actions related to supplementation and reintroduction are described, including specific projects, monitoring and research activities. Detailed descriptions of ongoing supplementation and reintroduction projects are provided as an appendix report.

Ecological Interactions

There are complex sets of interactions that occur between organisms that share an ecosystem, and summer chum salmon can be affected in both positive and negative ways. Such ecological interactions can include factors like competition for food and space, direct predation, sources of nutrient input to the ecosystem, etc. This section only addresses those negative competition and predation impacts that were identified in Part Two as; 1) potentially contributing to the summer chum decline (hatchery salmonids), and 2) possibly impacting recovery (marine mammal predation).

Hatchery Salmonids - The potential effects on summer chum salmon caused by hatchery production of anadromous salmonids are addressed by the following steps:

1. Average annual salmon and steelhead production from the Hood Canal and eastern strait of Juan de Fuca is summarized by program; including release numbers, size and life stage at release, and release timing. This information serves as a basis for assessment of potential impacts and determination of appropriate mitigation measures.

2. An assessment of each program (for each hatchery species) is made that identifies program risks of deleterious effects to wild summer chum. The assessment is made based on specific criteria that define conditions for high, moderate and lowrisk of impacts from hatchery operations, predation, competition, behavioral modification, and fish disease transfer.

3. Measures for risk aversion, monitoring, and evaluation are identified to reduce the risks of hatchery operational and ecological hazards to summer chum. The specific measures are described within the same categories used above in assessing hatchery impacts (i.e., hatchery operations, predation,

competition, etc.). Also, specific applications of the measures are recommended for each hatchery program to mitigate the risk factors identified in the above described program assessment.

The intent of the above described process is to reduce all moderate and high risks of hatchery programs to low risks. The co-managers are already implementing the risk aversion and monitoring and evaluation measures recommended in this section of the plan.

Marine Mammals - The impacts of predation by two pinniped species, harbor seal and California sea lion, on summer chum salmon requires further study. NMFS (1997b) has reported that where existing information on the seriously depleted status of many salmonid stocks is sufficient, it may warrant actions to remove pinnipeds in areas where pinnipeds prey upon depressed salmonid populations. Therefore, if predation on critical summer chum stocks is identified as substantial, mitigative measures may be applied to control the predation, including institution of federally authorized pinniped removal programs.

Habitat

Habitat is a critical element in the recovery of summer chum in Hood Canal and Strait of Juan de Fuca, because without high-quality habitat there is little likelihood that species recovery will be possible. This section of the plan initiates the discussion of habitat issues by describing the association between summer chum life stages and their habitats, in the streams and estuaries of Hood Canal and Strait of Juan de Fuca. Important natural processes that maintain these habitats are also discussed. To develop watershed-specific protection and restoration recommendations, available habitat data have been gathered, and aerial photos of streamside forests and subestuaries[1] have been examined. Habitat factors (stream flow, temperature, water quality, sediment, channel complexity, streamside forest condition, fish passage, and subestuary condition) have been rated by their degree of degradation in individual watersheds. Habitat factor ratings have shaped the development of watershed-specific protection and restoration measures (presented in an appendix report), and have allowed the summarization and comparison of conditions across watersheds.

Several key habitat factors are degraded in nearly all watersheds:

1. Riparian habitats along streams used by summer chum are degraded. These stands are dominated by small trees and deciduous species, and are frequently too narrow to provide fully functional habitat for summer chum.
2. In-stream habitat is also degraded. In most watersheds, stream-side development, water withdrawal, and channel manipulations (removal of large wood, dredging, bank armoring) have severely damaged salmon habitat.
3. Floodplains have been diked for residences and businesses and converted for agriculture. This has reduced the storage area of floodwaters. Habitat is degraded in the diked portions of the channel that is not allowed to meander naturally across the floodplain.
4. Most subestuaries have been developed for human use, which has resulted in loss or degradation of summer chum rearing habitat. Road and dike construction, ditching, dredging, filling, and other

[1] The river deltas at the mouths of tributaries to Hood Canal-SJF, which typically include a complex of tidal channel, mudflat, marsh, and eelgrass meadow habitats.

modifications have all taken their toll. In spite of their importance to salmon, these habitats have received only limited conservation attention to date.

While the evaluation of nearshore estuarine habitat impacts to summer chum have not been done in detail, available information suggests that shoreline development (bulkhead and dock construction) threatens summer chum habitat at the scale of the entire Hood Canal and Strait of Juan de Fuca region. This suggests that estuarine habitat recovery planning and implementation must be coordinated regionally.

Protection and restoration strategies for each habitat factor limiting to salmon recovery are described in the plan. In most cases protection strategies are needed throughout entire watersheds (not just the portion of the channel used by summer chum). Restoration options appropriate to a particular habitat factor are also outlined. The plan recommendations stress the need for protection and re-establishment of natural watershed, estuarine, and nearshore processes that are critical to the maintenance of summer chum habitat. The plan provides guidance to focus local recovery activities on the key limiting factors in individual watersheds, to help prioritize restoration funding to make the most efficient use of limited resources.

Both protection and restoration measures will have to be fully integrated into a coordinated recovery strategy involving landowners, community groups, the tribes, and government agencies. Habitat monitoring is discussed in this section of the plan, which stresses the need for a long-term focus and periodic evaluation so that learning can occur from successes and failures during recovery plan implementation. Finally, this section of the plan identifies key federal, state, and tribal government entities, and links their mandates and responsibilities with actions needed to fully recover summer chum habitat. Current institutional impediments, enforcement problems, and oversight limitations that will need to be overcome are also identified, and potential pathways to achievement of full recovery are provided.

Harvest Management

The short-term goal of the harvest strategies outlined in the plan is to protect the summer chum populations within Hood Canal and Eastern Strait of Juan de Fuca from further decline by minimizing the effect of harvest as a major factor for decline. The long-term goal of these strategies is to assist in the restoration and maintenance of self-sustaining summer chum populations while maintaining harvest opportunities on co-mingled salmon of other species.

Recommended harvest management measures are designed to limit fishing mortality to a rate that permits a high proportion of the summer chum run to return to spawning grounds, and thus accommodate the maintenance and rebuilding of self-sustaining populations. Furthermore, the measures will apportion harvest impacts between or within management units[2] based on population status and individual population characteristics, and to result in a broad distribution of spawners throughout all stocks in the HC-SJF region. These harvest management actions, when coordinated with habitat protection/restoration and supplementation actions, should lead to the maintenance and restoration of genetic and biological diversity within the region.

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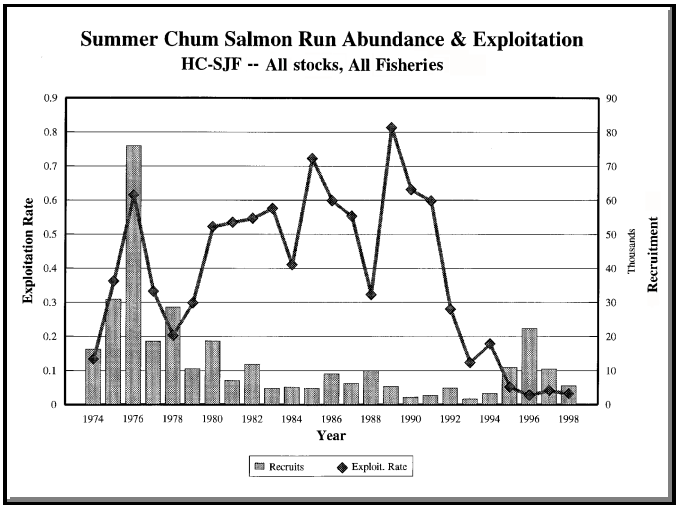
[2] A management unit is defined as "A stock or group of stocks which are aggregated for the purposes of achieving a desired spawning objective". Conceptually, the management unit approach is designed to recognize the practical and biological limitations to how we can manage fisheries for salmon populations.

Harvest Management Strategies -

Base Conservation Regime - The harvest management strategies described in the plan are expected to result in significant reductions of total exploitation rates on HC-SJF region summer chum, compared to those observed in the period from 1975 to 1992. The plan accomplishes that by establishing an annual fishing regime (called the Base Conservation Regime) for Washington pre-terminal, and Washington terminal area fisheries, and recommends harvest rates for Canadian fisheries. These fishing plans are designed to minimize incidental impacts to summer chum salmon, while providing opportunity for fisheries conducted for the harvest of other species. The fishery specific management measures comprising this regime are outlined in tabular form in the plan. Actions include closure of summer chum-directed fisheries, delayed or truncated fishery openings for other salmonid species designed to protect approximately 90% or more of the run of each HC-SJF summer chum management unit, chum non-retention in fisheries directed at other species, and area closures around freshwater spawning tributaries. The expected reduction in incidental interceptions, relative to the high rates observed during previous years is approximately78% for Canadian fisheries, 65% for U.S. pre-terminal, and 92% for Washington terminal area fisheries. The Base Conservation Regime will conserve, and not appreciably reduce the likelihood of survival and recovery of HC-SJF summer chum in the wild. Many of the harvest restrictions incorporated in the Base Conservation Regime have been initiated in recent years. The result has been a major reduction in exploitation rates and harvest of summer chum salmon (see figure).



Hood Canal and Strait of Juan de Fuca summer chum abundance and incidental fishery exploitation rates.

Exploitation Rate Expectations - The management actions described in the Base Conservation Regime are expected to result in, on the average, a 10.9% total (range = 3.3-15.3%) incidental exploitation rate on the Hood Canal management units and 8.8% (range=2.8-11.8%) incidental exploitation rate on Strait of Juan de Fuca management units (see table).

Expected Base Conservation Regime incidental exploitation rates and ranges by fishery.

Fishery	Lower Guideline	Expected Average Exploitation Rate	Upper Guideline
Canadian	2.3%	6.3%	8.3%
U.S. pre-terminal	0.5%	2.5%	3.5%
Hood C. terminal	0.5%	2.1%	3.5%
Hood Canal Total[1]	3.3%	10.9%	15.3%
SJF Total[2]	2.8%	8.8%	11.8%

[1] Total of Canadian, U.S. pre-terminal, and Hood Canal terminal exploitation rates.

[2] Total of Canadian and U.S. pre-terminal exploitation rates. There is no terminal area harvest of Strait of Juan de Fuca stocks.

Harvest Regime Modification - If incidental exploitation rates are higher than expected, or the critical thresholds for abundance or escapement (described in Part One) are not met, the co-managers will investigate whether or not to implement additional harvest management measures (as provided for in the plan), which may be necessary to assist in restoring the management unit or stock to non-critical status. When exploitation rates are less than expected, or population-based recovery goals are exceeded, then the possibility of liberalizing the harvest regime may be considered. However, the co-managers still must develop and achieve the population-based recovery goals and determine how to structure a recovery harvest regime before directed harvest would be considered.

Fishery Performance Standards - By achieving fishery performance standards, the harvest element will contribute to the stability and recovery of the HC-SJF summer chum. The following fishery performance standards will be used to assess whether the harvest management strategy is being successfully implemented.

Compliance - Regulations are adopted and implemented consistent with the plan's management actions, and enforcement patrols indicate a high level of compliance with regulations adopted consistent with the plan.

Exploitation Rates - Exploitation rates are within the identified range in any year. At the time of 5-year plan review the expected rates are within the established range and are not clustered toward either extreme of the range.

Preseason Forecasts - Annual run size forecasts are a component of our performance standards for harvest regime assessment and modification, and efforts should be made to ensure they are as precise and accurate as possible.

Compliance and Enforcement - "Compliance" is adherence, by each of the parties, to the guidelines, mandates and performance standards of the plan, including adoption of any necessary regulations to implement their responsibilities under the plan. Compliance certainty shall be assured through the application of U.S. v Washington rules and procedures. "Enforcement" shall mean the efforts of each party to implement the guidelines, measures and standards of the plan, including the enforcement of rules and regulations adopted to implement the guidelines, measures and standards.

Harvest Management Monitoring and Assessment - Specific, integrated monitoring programs shall be established to improve stock assessment methodologies as well as effectiveness of harvest management actions and objectives. These programs should include, at least: 1) consistent escapement monitoring methods, 2) identification and quantification of harvest contributions, 3) assessment of survival rates to recruitment by age, and 4) assessment of stock productivity and productive capacity. Escapement and harvest monitoring form the core elements of the monitoring program. These core elements are stable and will continue at or above current levels. Information gained from the other suggested monitoring activities would improve management, but additional funding and resources will be required for implementation. The co-managers have designed the management actions in this plan to provide sufficient protection for summer chum populations at the current levels of monitoring. The co-managers commit to maintaining the core elements of the monitoring programs, and recognize that the additional monitoring activities are important over the long term and funding support will be sought for them.

Program Integration and Adaptive Management

The summer chum salmon conservation initiative is intended to be an integrated plan, with each element contributing in concert with the other elements, leading to a successful outcome in restoring these summer chum populations. Each of the preceding sections of Part Three addresses a specific element of the plan and defines how the performance (compliance and effectiveness) of the specific strategies and actions relevant to that element will be evaluated. However, the success of the overall plan can only be measured by how well the populations of summer chum respond. The following section describes the measures that will be used to evaluate the performance of the plan relative to specific population criteria.

Critical Threshold Response - If any management unit or stock falls below its critical abundance or escapement threshold, the co-managers will: 1) promptly identify any emergency actions that can be taken immediately to respond to the critical condition, and 2) within six months, prepare an assessment of the factors resulting in this failure to determine if actions and modifications to the plan are necessary to promptly restore the management unit or stock to non-critical status. The emergency response will include any actions that can be implemented to avoid further declines in abundance while the causes for the failure are being evaluated and corrective actions developed.

Annual Plan Report - Annually, management actions and their results are assessed for compliance with the specific plan provisions, including the determination if any critical population thresholds have been triggered. In the preceding sections on Artificial Production, Ecological Interactions, and Harvest Management, there are descriptions of annual actions that must be taken to assess compliance with and effectiveness of the plan provisions. By June of each year the co-managers will compile the annual assessments required in Part Three of the plan into an annual plan progress report.

Five Year Plan Review - A five year plan review will assess whether progress towards recovery is being achieved and whether the results of monitoring and evaluation studies indicate a need to revise assumptions and/or strategies and actions. As stocks within management units are rebuilt, the plan review will determine if the conservation and recovery criteria are being met, and will incorporate the results of monitoring and evaluation studies.

Population-Based Performance Standards - Specific population-based performance standard criteria are provided for the following categories. The measurement of several of the following standards (e.g. productivity) is dependent on the collection of representative age data.

Abundance - As used in the plan, abundance refers to the annual total number of adult recruits or the adult run size prior to any fishing related mortality. Escapement refers to the portion of the abundance that has "escaped" through the various fisheries and arrived on the spawning grounds. Progress toward recovery of abundance and escapement will be measured by the performance of natural-origin recruits (NOR) of each management unit and the stock(s) within them. The abundance standards are: 1) annual post season estimated abundance must be equal to, or greater than that of the parent brood abundance; 2) it should be stable or increasing and 5-year average abundance must be higher than the critical threshold; and 3) annual estimated abundances shall not fall below the critical threshold in more than two of five years.

Productivity - As used in the plan, productivity refers to the ratio of maturing recruits per parent brood spawner. The standards are: 1) five year mean estimated productivity shall be greater than 1.2 recruits per spawner, and 2) the number of recruits per spawner when management units are at or near critical thresholds must be stable or increasing.

Escapement - Annual NOR escapements shall be: 1) stable or increasing, and 2) 5-year average escapements must be higher than the critical thresholds (see table, page xiv). Information concerning the productivity and productive capacity of the stock(s) shall be used to further refine the thresholds themselves.

Management Actions - At a minimum, the plan strategies and actions shall result in stable recruit abundances at current levels, while ensuring that escapement rates are high. The plan's strategies shall be considered successful if progress toward recovery is demonstrated by positive trends in NOR abundance. Strategies and actions directed at management units or stocks whose abundance is below their currently estimated thresholds, will be considered successful if they stop and reverse the decline in productivity and/or abundance.

Part Four
Summary of Plan Elements

Part Four provides tabular summaries to show what and where specific objectives, strategies, and actions are to be applied, and by whom, to meet the plan's goal of protecting and restoring the summer chum runs. Additionally, this part of the plan discusses how the plan goal and ESA objectives are being addressed, the development of population-based recovery goals, and implementation of the plan.

Summary of Plan Objectives, Strategies, and Actions

Plan objectives, strategies, and actions are summarized in tabular descriptions of Artificial Production, Ecological Interactions, Harvest Management, Habitat, Monitoring and Evaluation, and Program Integration and Adaptive Management. For each objective, one or more actions/strategies are described: including the participants with jurisdiction/authority, additional partners, status of available resources/funding, and time frame. These summaries are intended to provide quick reference to the elements of this initiative.

Accomplishing Goals of the Recovery Plan and Meeting ESA Objectives

Achieving the Recovery Plan Goal - Recovery activities for summer chum salmon were begun by the co-managers in 1992. The recovery goal was, and still is, to return summer chum salmon to full health and to allow future harvests (see definition in Foreword section). The recovery objectives and actions identified for artificial production, ecological interactions, and harvest management will be immediately implemented by the co-managers (most are already underway). The implementation of strategies for habitat recovery is necessarily an activity that is longer term and will involve participants other than just the co-managers.

In summary, the following results from implementation of the initiative are expected. No further extinctions will occur. Re-introductions of summer chum to currently unpopulated streams will occur through time.

The past negative consequences potentially resulting from hatchery fish interactions will be largely eliminated as a precautionary measure. The impacts of incidental fishery harvests on summer chum stocks will be minimized. Habitat, both freshwater and estuarine, will be gradually returned to a more productive state. Annual monitoring, evaluation, and adaptive management will assure that recovery objectives are achieved. Ultimately, the combined effects of these actions will recover summer chum salmon.

Meeting ESA Objectives - In 1996, NMFS published a document titled "Coastal Salmon Conservation: Working Guidance for Comprehensive Salmon Restoration Initiatives on the Pacific Coast". The purpose of this guidance is to identify the elements that would constitute a successful salmon recovery plan. NMFS described three major criteria to be met by a conservation plan: 1) the plan must have substance; that is, it includes measures that will effect recovery; 2) there must be certainty that the measures will be undertaken by the parties with the authority and means to implement recovery actions; and 3) the plan must include monitoring and assessment that will lead to effective adaptive management and help determine what recovery is and when it occurs. This recovery plan provides the basis for addressing all three criteria.

Population-Based Recovery Goals

Specific quantitative, population-based recovery goals are needed to determine when recovery has been achieved. These goals should define recovery in terms of population abundance, productivity, and diversity. The co-managers are developing a comprehensive set of population-based recovery goals that are scheduled for completion in spring 2000, and will be made available in a supplement to the this recovery plan.

Plan Implementation

The plan is a comprehensive document that addresses all the components for protection and recovery of summer chum and provides a scientific basis for recommending actions/strategies. The fisheries co-managers, WDFW and PNPT Tribes, are committed to carrying out those provisions of the plan for which they have the authority (measures addressing harvest management, artificial production and ecological interactions). However, particularly with respect to summer chum habitat, the plan is only the first step to a larger planning and implementation effort that must continue if recovery of the summer chum is to succeed. Counties and other agencies, who have not participated in the development of the plan but have provided review comments during its development, are encouraged to address the recommended strategies and actions that fall under their jurisdiction or authority. This will lead to additional planning, that will result in definition and execution of specific protection and recovery actions. The support of landowners, private non-profit organizations, volunteer groups, and local citizens is also important if these efforts are to succeed. The co-managers will offer technical support in how to interpret and apply the recommendations of the plan.

It is expected that many measures identified in the plan will subsequently be developed further based on recommendations contained in the plan. These should be incorporated into the ESA permitting process, which has been in development during the same time frame as the plan. There may be a need to adapt or modify measures within the plan in response to the permitting requirements (i.e., under ESA sections 4 (d), 7 or 10).

Foreword

Introduction

In recent years, it has become apparent that many wild salmon populations in the northwest have experienced serious declines in abundance due to a variety of factors negatively influencing the salmon and their environment imposed by our modern society. In some cases these wild salmon populations have declined to the point where they face immediate risks of permanent harm or even extinction.

In response to these declines in wild salmon populations, the tribes in western Washington and the Washington Department of Fish and Wildlife (WDFW), in 1991, began a broad and ambitious effort to halt the decline and restore these populations, referred to as the Wild Stock Restoration Initiative (WSRI). The first step in the WSRI was to inventory the status of all wild salmonid populations. This task, the Salmon and Steelhead Stock Inventory (SASSI), was completed in 1993 and identified a number of populations that were believed to be in critical condition. A critical rating meant that the biologists reviewing the status of the populations felt that the stock of fish was "experiencing production levels that were so low that permanent damage to the stock is likely or has already occurred". The inventory identified most of the summer chum originating in Hood Canal and the Strait of Juan de Fuca as being in critical condition.

Hood Canal and Strait of Juan de Fuca summer chum experienced a severe drop in abundance in the 1980s, along with other chum salmon throughout the Puget Sound region. The summer chum remained at very low levels even though other chum stocks rebounded by the mid to late 1980s. The region's summer chum returns hit all time lows in 1989 and 1990 with less than a thousand spawners in total. In response to this alarming decline and consistent with the WSRI and the critical status identified in SASSI, the state and tribal co-managers implemented actions in 1992 to afford greater protection of summer chum in terminal area fisheries and, together with the U.S. Fish and Wildlife Service (USFWS) and citizen groups initiated hatchery supplementation programs

Hood Canal and Strait of Juan de Fuca Salmon Co-managers

The Point-No-Point Treaty Tribes including: the Skokomish Tribe, the Port Gamble S'Klallam Tribe, The Jamestown S'Klallam Tribe, and the Lower Elwha Klallam Tribe; and the Washington State Department of Fish and Wildlife.

on two summer chum stocks utilizing native brood stocks. Those actions have been expanded in subsequent years and have resulted in this Summer Chum Salmon Conservation Initiative (also referred to in the document as the "recovery plan", or simply "the plan").

In addition to the concerns of the tribal and state co-managers, the National Marine Fisheries Service (NMFS) initiated coast-wide status reviews for all west coast salmon species under the Endangered Species Act (ESA) in 1994. The NMFS review of chum salmon found that the summer chum originating from Hood Canal and the Strait of Juan de Fuca represented an Evolutionarily Significant Unit (ESU). They further found in their review that this ESU was at some risk of extinction and in March of 1999 the summer chum salmon were listed under the ESA as a threatened species.

Goal of the Initiative

The goal of the Summer Chum Salmon Conservation Initiative is:

To protect, restore and enhance the productivity, production and diversity of Hood Canal summer chum salmon and their ecosystems to provide surplus production sufficient to allow future directed and incidental harvests of summer chum salmon.

This Hood Canal and Strait of Juan de Fuca Summer Chum Salmon Conservation Initiative is intended to formalize and expand on the recovery efforts already initiated for Hood Canal and Strait of Juan de Fuca summer chum salmon, such that there will be a comprehensive and cohesive strategy or plan for the recovery and restoration of these populations.

Parties to the Recovery Plan

The co-managers (the Point-No-Point Treaty Tribes and WDFW) along with USFWS, and NMFS are "parties" to the recovery plan.

The recovery plan applies to all summer-timed chum salmon returning to streams in Hood Canal and the eastern Strait of Juan de Fuca, including populations that may have been extirpated. This is consistent with the scope of the ESU defined by NMFS for ESA purposes. The agencies involved with the development of this plan and committed to ensuring it is implemented, include the Skokomish Tribe, the Port Gamble S'Klallam Tribe, the Jamestown S'Klallam Tribe, and the Lower Elwha Klallam Tribe; the WDFW; USFWS; and the NMFS.

The recovery plan has both short-term and long-term objectives. Some actions and measures will be implemented immediately (or have already been implemented) to stabilize these populations and increase their abundance, while others will be implemented over a longer time frame to effect the broader recovery and restoration of the populations and the fisheries that depend on them. It is the intent of the agencies that developed the plan that it be an adaptive plan that will encourage collection of new information on these populations and will be modified and adapted as we learn what works and what doesn't in meeting the overall plan goal. Thus, there are many actions and

measures still to be developed based on the results of further assessments. The success of the recovery plan will determined by how well the specific objectives are achieved in each of the functional elements of the plan and how well the overall goal is achieved.

Relevant Standing Orders and Agreements

The Puget Sound Salmon Management Plan (PSSMP) and the Hood Canal Salmon Management Plan (HCSMP) are federal court orders that currently control both the harvest management rules and production schedules for salmon in Hood Canal. The parties recognize that it may be necessary to modify these plans in order to implement the recommendations that will result from this summer chum plan. However, the provisions of the PSSMP and HCSMP will remain in effect until modified through court order by mutual agreement.

Previous agreements between the state and the tribes that may have a bearing on this plan include the Hood Canal Production and Evaluation Program (HCPEP) and the Hood Canal Wild Coho Salmon Evaluation and Rehabilitation Program (HCWCP). The HCPEP was implemented in 1989, outlining a six year study plan to evaluate new salmon production alternatives. The results of the HCPEP may be used to guide activities included within this plan.

The HCWCP carries the objective of rebuilding the Hood Canal wild coho salmon stocks. Management measures outlined in the HCWCP that are designed to facilitate rehabilitation of Hood Canal wild coho stocks must also address management of summer chum that commingle with coho. Sections included within the HCWCP regarding development of a comprehensive approach for protection and rehabilitation of Hood Canal salmon habitat should also benefit summer chum production. To the extent practicable, efforts directed towards the rehabilitation of Hood Canal wild coho will be designed to benefit summer chum as well.

When agreed to by the co-managers, modification of the above plans will be accomplished as necessary as part of the implementation phase of the summer chum recovery plan.

Ongoing Activities, Initiatives, and Processes

The following is a chronological list of major efforts directed at or contributing to the recovery of Hood Canal and Strait of Juan de Fuca summer chum salmon.

1992 - Wild Stock Restoration Initiative (WSRI)

In 1992, the Washington Department of Fish and Wildlife and the Western Washington Treaty Indian Tribes (WWTIT) began a process to develop the Washington State Salmon and Steelhead Wild Stock Restoration Initiative. The Initiative's goal is "to maintain and restore healthy wild salmon and steelhead stocks and their habitats in order to support the region's fisheries, economies, and other societal values" (WDF et al. 1993).

An initial task under this initiative was to develop a Salmon and Steelhead Stock Inventory (SASSI). The State fisheries agencies and the WWTIT reviewed the salmonid stocks and reported on their status (WDF et al.. 1993, WDFW and WWTIT 1994). Completion of this inventory was the first step in a statewide effort to maintain and restore wild salmon and steelhead stocks and fisheries. The inventory represents the starting point to address the objective of restoring stocks identified as "depressed" and "critical". All but one of the identified Hood Canal summer chum stocks were classified critical or depressed in the inventory.

1992 - Artificial Production

Summer chum supplementation projects were begun in 1992 on the Big Quilcene River, Lilliwaup Creek and Salmon Creek. The recent project on the Big Quilcene River is a joint effort by the WDFW, Point No Point Treaty (PNPT) Tribes and USFWS, that was initiated because the summer chum population in the Big Quilcene River was depressed to the point that immediate intervention was necessary and because the habitat in the lower river was extremely degraded. The agencies and PNPT Tribes began this program to rebuild and protect the summer chum run until the habitat was recovered and able to support natural production. The project included modification of Tribal fisheries to minimize summer chum interceptions and help collect brood stock. Eggs were taken to the Quilcene National Fish Hatchery on the river where they were hatched, reared and released. The project continues to the present day; its initial success in rebuilding the run indicated by the high returns in recent years.

A supplementation project was also begun in 1992 on Lilliwaup Creek with the objective of rebuilding the summer chum run of that stream. The project is operated by Long Live the Kings, a non-profit salmon conservation group, under the supervision of WDFW. Eggs are collected and, after hatching and early rearing, the summer chum fry are released back into the stream. The desire to minimize impacts on natural spawning in the creek and difficulties encountered in collecting brood stock have resulted, so far, in this being an intermittent, low production project.

A citizen volunteer conservation group, Wild Olympic Salmon, began a cooperative effort with WDFW to supplement summer chum salmon in Salmon Creek in 1992. This project is similar in operation to the other two, except that final rearing before release of the fry occurs in a saltwater net pen near the mouth of Salmon Creek. The initial success of the project is indicated by escapement levels approaching 900 fish in recent years.

The Hood Canal Salmon Enhancement Group began a cooperative project with WDFW in 1997 to rebuild summer chum salmon in the Hamma Hamma River. Operations are similar to the other supplementation projects. However, there were problems collecting brood stock in the first years of the project.

In 1996, two projects were begun to reintroduce summer chum into streams where they had been extirpated, Big Beef Creek and Chimacum Creek. The donor population for the Big Beef project was the Quilcene River brood stock, where a surplus of eggs was available. Similarly, surplus eggs were made available for the Chimacum project from the Salmon Creek project. The project operations include the hatching, early rearing and release of juvenile summer chum. WDFW

participates with the University of Washington (at its research station) and another citizen volunteer organization, the Hood Canal Salmon Enhancement Group, in operating the Big Beef project. Wild Olympic Salmon is the cooperator with WDFW on the Chimacum project.

These summer chum salmon recovery efforts are described in more detail in Part Three - 3.2 Artificial Production.

1992 - Harvest Management

Summer chum are subject to fisheries harvest in mixed stock areas, terminal marine areas and freshwater areas. Beginning in 1992, the co-managers substantially reduced the harvests of summer chum salmon in terminal marine and freshwater fishing areas.

The terminal marine areas for Hood Canal summer chum are Sequim Bay, Discovery Bay, and Dungeness Bay, along with all marine areas in Hood Canal south of the Hood Canal Bridge. No commercial harvest has been allowed for any salmonid species in either Sequim or Discovery bays since 1976. Within Hood Canal proper, there has been a directed fishery at summer chum within the terminal marine areas only in 1976, when an unusually high return of summer chum was observed. All other catches of summer chum have been the result of fisheries directed at chinook and coho salmon. Since 1992, tribal, commercial, and sport fisheries have been substantially modified to minimize summer chum interceptions.

Treaty fisheries, within freshwater areas and during the times summer chum may be present, have in recent years only been conducted within the Big Quilcene and Skokomish rivers. Since 1990 there have been no treaty net fisheries in the Quilcene River.

Mixed stock fisheries interceptions (as by-catch of fisheries directed at other species or runs) can occur in Canadian fishing areas and in Washington pre-terminal areas, including the Strait of Juan de Fuca, San Juan Islands, Admiralty Inlet and central Puget Sound. The impact on summer chum salmon has been estimated for these fisheries, and harvest management actions are being taken to protect summer chum. Overall, the Hood Canal summer chum bycatch of these fisheries can be significant. The co-managers intend to continue to obtain genetic samples to refine the relative estimates of impacts on Hood Canal summer chum.

For a more detailed discussion of the management of fisheries affecting summer chum salmon, see Part Three - 3.5 Harvest Management.

1993 - Wild Salmonid Policy (WSP)

In 1993, the Washington State Legislature passed EHB 1309 that directed WDFW to develop a wild salmonid policy that "*shall ensure the department actions and programs are consistent with the goals of rebuilding wild stock populations to levels that permit commercial and recreational fishing opportunities.*" Prior to the legislative initiative, the state and the tribes were working towards maintaining and achieving healthy native populations. The WDFW Commission adopted a wild salmonid policy in December 1997. Presently, WDFW is bound by the provisions of the policy. The

goal, direction, and provisions of the summer chum recovery initiative are consistent with the guidance within the WDFW Wild Salmonid Policy.

1994 - Endangered Species Act (ESA)

In 1994 the Northwest Region of the National Marine Fisheries Service (NMFS) received three petitions for the listing of distinct populations of chum salmon from Puget Sound and the Strait of Juan de Fuca (including Hood Canal summer chum). In response to these petitions, NMFS reviewed the status of chum salmon. As a result, a Hood Canal summer chum ESU was defined and Hood Canal and Strait of Juan de Fuca summer chum were formally listed as a threatened species under ESA in March of 1999. The Hood Canal Summer Chum Initiative is meant to complement ESA activities and to provide the basis for additional planning to recover these summer chum stocks.

Several recent planning processes and documents have been developed to guide management of at-risk salmonid populations. These efforts have a bearing on the present initiative in that they reflect the current thinking and direction of planning for salmonid protection and recovery. The Hood Canal summer chum initiative has been prepared in full cognizance of the following documents.

> Coastal Salmon Conservation: Working Guidance for Comprehensive Salmon Restoration Initiatives on the Pacific Coast (NMFS 1996a).
>
> Status review of chum salmon from Washington, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-32. (Johnson et al. 1997).

1994 - Hood Canal Coordinating Council (HCCC)

The HCCC is a council of governments formed under Washington State RCW 29.34 consisting of Jefferson, Kitsap and Mason counties, Port Gamble S'Klallam and Skokomish tribes, and with the support of federal and state agencies. Its mission is to coordinate actions that protect and restore the environment and natural resources of the Hood Canal basin. It also provides educational services to local communities. The Council began to consider responses to summer chum needs following the initiation of the NMFS chum status review in 1994.

1997 - Governor's Salmon Recovery Office (SRO)

The Governor's Salmon Recovery Office was legislatively created (ESHB 2496) to provide overall coordination for the state's salmon recovery and ESA response. The SRO works with the Joint Cabinet and its member natural resource agencies to develop the Statewide Salmon Recovery Strategy, along with an implementation plan with performance measures to monitor progress. The SRO also works with regional and sub-regional salmon recovery entities and lead entities to develop salmon recovery plans and ESA responses.

1997 - Conservation Commission

The Washington State Legislature tasked the Conservation Commission, under ESHB 2496, to oversee the development of a state-wide habitat related limiting factors analysis for salmon recovery (in consultation with technical advisory groups).

1997 - Salmon Recovery Lead Entities

Also under ESHB 2496, the legislature authorized the formation of "Lead Entities" from local groups or governments. Lead Entities are empowered to solicit and prioritize salmon habitat restoration projects, and to seek funding from Salmon Recovery Funding Board. Where available, the Lead Entities are mandated to use the Limiting Factors Analysis, produced by the Conservation Commission, as a basis for project prioritization.

1999 - Salmon Recovery Funding Board

The Salmon Recovery Funding Board provides support to Lead Entities for salmon recovery by funding habitat protection and restoration projects that produce sustainable and measurable benefits for wild salmon and their habitat. Established under SB 5595, the Salmon Recovery Funding Board disperses state and federal monies through a scientific review process to ensure a coordinated and consistent accounting of funding appropriated for salmon recovery.

2000 - Forest and Fish Report

The Forest and Fish Report and associated WACs (under ESHB 2091) represent the development and implementation of emergency rules and programs for non-federal forest practice activities, and are designed to achieve the following goals: 1) to provide compliance with the Endangered Species Act for aquatic and riparian-dependent species on non-federal forest lands; 2) to restore and maintain riparian habitat on non-federal forest lands to support a harvestable supply of fish; 3) to meet the requirements of the Clean Water Act for water quality on non-federal forest lands; and 4) to keep the timber industry economically viable in the State of Washington. The emergency rules remain in effect until June 30, 2001, or until permanent rules are adopted by the Forest Practices Board.

Plan Development and Organization

Staff of the PNPT Tribes, WDFW, NWIFC, USFWS and NMFS have participated in development of this conservation initiative (or plan) for Hood Canal and Strait of Juan de Fuca summer chum. This has been a technical process that has included analysis and summarization of existing data and the formulation of a management process for protection, recovery and restoration of the summer chum.

Plan Development

This conservation initiative (or plan) has been developed and agreed upon by the WDFW and the PNPT Tribes under their authority to co-manage these salmon populations pursuant to the rules and orders of U.S. v. Washington (1974). This plan is consistent with and fulfills the intent of section 13 of the Puget Sound Salmon Management Plan (1985), which calls for the development of comprehensive regional resource management plans for Puget Sound stocks of salmon. The USFWS and NMFS have also participated in the development of this plan at the request of the WDFW and the PNPT Tribes. The USFWS participated largely because of their involvement with artificial production in the region and their general background in providing technical support for tribal/state fisheries management programs. The NMFS participated to assist the co-managers develop a plan which will also satisfy NMFS's concerns and criteria for recovery under the ESA, and to fulfill their trust obligations to the tribes to provide technical support.

United States v. Washington

More commonly referred to as the "Boldt Decision", U.S. v. Wash. is the 1974 Federal Court Decision (and subsequent orders) that affirmed the fishing rights of western Washington Treaty Indian Tribes.

A rough draft of the plan was prepared in January 1997. This initial draft was incomplete; a number of harvest management issues had not yet been resolved, supplementation planning required refinement, and the habitat protection and recovery component had not yet been developed. Still, the draft was submitted to NMFS to inform them of the status of the planning effort. Comments were subsequently received from NMFS that encouraged the parties to proceed with the full development of the plan.

The planning effort was renewed in the summer of 1997 with the objectives of providing direction for the management and recovery of summer chum. NMFS advised the co-managers that to be successful the initiative must: 1) include substantive management provisions with measurable performance standards, 2) incorporate participation of all parties possessing the management authority necessary to carry out the provisions, 3) provide for effective monitoring and evaluation to determine whether performance standards are being met, and 4) be adaptive to changing circumstances and knowledge gained over time. Agency and tribal staff have worked to meet these criteria in preparing the conservation initiative. Personnel from NMFS have participated in planning meetings and work sessions to facilitate communication with that agency, a need made more apparent by the official listing of Hood Canal and Strait of Juan de Fuca summer chum as a threatened species in March 1999.

Plan Organization

Organization of the conservation initiative is in five major parts: Foreword, which sets the stage; Part One - Life History and Stock Assessment, which describes summer chum life history, and discusses the available data and provides stock evaluation tools; Part Two - Region-wide Factors for Decline, which provides a region-wide analysis and summary of those factors believed responsible for the

recent decline of summer chum; Part Three - Evaluation and Mitigation of Factors for Decline, which provides more detailed, location-specific analysis of factors affecting summer chum and presents strategies for their protection and recovery; and Part Four - Summary of Plan Elements, which provides a comprehensive description of the management components, and also describes specific actions, evaluation and monitoring, roles of the participating parties, and time frames.

Four workgroups of technical staff were formed to perform technical analyses and prepare individual sections of the initiative. A general organizational workgroup was responsible for developing Parts One, Two, and Four, and for editing and assembling the final document. The three other workgroups performed technical analyses and addressed management strategies pertaining to 1) habitat protection and recovery, 2) harvest management, and 3) supplementation, reintroduction, and ecological interactions. The products of these latter three workgroups are presented in Part Three and are summarized in Part Four of the initiative.

This document is organized to meet the needs of the co-managers in terms of clearly laying out the problems that exist, actions that will be taken, and the goals and objectives to be achieved. It is also designed to address the issues raised in the NMFS status review for chum salmon and to address their needs for a recovery plan under the ESA. Part One of the plan clearly lays out the status of the region's summer chum populations as we understand them with our current knowledge and also identifies what we don't know and need to know for the plan to be effective. There are substantial discussions of the factors for decline (Parts Two and Three), which are pivotal components of the recovery plan for setting priorities and tying action strategies back to specific problems they are designed to correct. Part Three contains four sections that deal with the broad categories of recovery under Artificial Production, Ecological Interactions, Habitat, and Harvest Management, and these sections contain both evaluations of factors for decline and the substance and details of the specific recovery assessments, strategies and actions. Also Part Three includes the section, Plan Integration and Adaptive Management, that describes management responses to populations at critical threshold, outlines procedures for reviewing and modifying the plan, and presents performance standards. Finally, Part Four discusses what recovery and restoration means in the context of the plan, summarizes objectives, strategies, and actions in each recovery category, and discusses plan implementation.

Future Actions

It is the intent of WDFW and the PNPT Tribes to implement this initiative as a comprehensive regional management plan, as provided for in the Puget Sound Salmon Management Plan. Some elements of the plan require agreement from tribes other than PNPT Tribes. Upon gaining their concurrence, the plan will be adopted as an agreed plan in the U.S. v. Wash. proceeding. The implementation of the elements of the plan, that are specifically within the jurisdiction of the state and tribal co-managers, would then be under a Federal court order. This will provide certainty that the sections of the plan dealing with the fishery management elements of harvest and artificial production will be carried out consistent with the plan.

The implementation of the habitat element of this plan will involve a continuing and evolving process. The habitat element assesses habitat factors for decline and recommends strategies and actions to sustain and rebuild summer chum salmon in this region. However, the authorities to implement these measures is dispersed through a variety of federal, state and local jurisdictions. The parties to this plan will continue to work with the appropriate jurisdictions on developing the implementation plans for habitat protection and restoration. This will include working with the lead entities, Hood Canal Coordinating Council and local governments, the Governor's Salmon Recovery Office, the Salmon Recovery Funding Board, U.S. Forest Service, etc. Implementation plans developed by these agencies and processes are expected to be consistent and integral to this plan and are vital to its success.

The Summer Chum Salmon Conservation Initiative provides specific actions to be taken to lead to the recovery of the region's summer chum salmon. It is anticipated that management of all elements of the plan will periodically be evaluated and reshaped if necessary to achieve plan objectives. To facilitate this adaptive management approach, annual reports will be prepared to gage progress and assess the effectiveness of actions taken. In addition, five year plan reviews will be conducted to measure overall progress toward recovery and evaluate and/or revise the strategies and actions provided in this plan.